THIS OPINION WAS NOT WRITTEN FOR PUBLICATION

The opinion in support of the decision being entered today was not written for publication and is not binding precedent of the Board.

Paper No. 13

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

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Ex parte EDWARD C. COUBLE, MARK J. KAPECKAS, STEVEN M. FLORIO, and DAVID L. JACQUES

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Appeal No. 2000-1835
Application No. 08/868,092

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ON BRIEF

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Before OWENS, KRATZ and DELMENDO, Administrative Patent Judges.
KRATZ, Administrative Patent Judge.

DECISION ON APPEAL

This is a decision on appeal from the examiner's final rejection of claims 13-23, which are all of the claims pending in this application.

BACKGROUND

Appellants' invention relates to a process for electroplating the walls of holes in a printed circuit board. Appellants state that "[t]he rejected claims do not stand or fall together" (brief, page 5). Accordingly, we shall treat the

appealed claims separately to the extent justified by appellants' arguments in the brief. An understanding of the invention can be derived from a reading of exemplary claim 13, which is reproduced below.

13. A process for metallizing the walls of holes within a printed circuit board substrate having metallic and non-metallic regions, said process comprising the steps of treating the printed circuit board substrate with a single aqueous acid solution containing a hydroxyl ammonium reducing agent and an amine polyelectrolyte, contacting the so treated surface with an aqueous dispersion of carbonaceous particles to form a coating of said dispersion over all surfaces of said substrate and electroplating metal on said substrate from an electrolytic metal plating solution.

The prior art references of record relied upon by the examiner in rejecting the appealed claims are:

Growald et al. (Growald)	3,674,711	Jul. 04, 1972
Doty et al. (Doty)	3,962,497	Jun. 08, 1976
Hou et al. (Hou)	4,309,247	Jan. 05, 1982
Pendleton	5,015,339	May 14, 1991
Toro	5,143,592	Sep. 01, 1992
Florio et al. (Florio)	5,683,565	Nov. 04, 1997 (filed May 23, 1996)

Claims 13-16 and 20-23 stand rejected under 35 U.S.C. § 103 as being unpatentable over Pendleton in view of Doty, Growald and Florio. Claims 17-19 stand rejected under 35 U.S.C. § 103 as being unpatentable over Pendleton in view of Hou and Toro.

We refer to the brief and to the answer for the opposing viewpoints expressed by appellants and by the examiner concerning the above-noted rejections.

OPINION

We have carefully considered all of the arguments advanced by appellants and the examiner and agree with appellants that the aforementioned § 103 rejections as they pertain to claims 14-17, 19 and 22 are not well founded. However, appellants have not convinced us of any reversible error in the examiner's § 103 rejections as they pertain to claims 13, 18, 20, 21 and 23. Accordingly, unlike the other appealed claims, we shall sustain the examiner's rejections as they pertain to claims 13, 18, 20, 21 and 23.

§ 103 Rejection Over Pendleton, Doty, Growald and Florio

Starting with independent claims 13 and 21, we note that Pendleton discloses a process for electroplating a printed wiring (circuit) board substrate that substantially corresponds to the process of appealed claims 13 and 21. Pendleton teaches that, inter alia, a solution containing a polyelectrolyte and a reducing agent is used to treat the substrate, which is followed by contacting the so treated substrate with a liquid dispersion of carbon black particles to coat the surfaces of the substrate.

Subsequently metal is electroplated on the substrate. See, for example, the abstract and column 6, lines 25-58 of Pendleton. Pendleton (column 6, lines 59-62) further discloses that the method is particularly useful for electroplating nonconductive portions of through hole walls of printed wiring boards. Pendleton (column 7, lines 6-10 and the paragraph bridging columns 9 and 10) teaches that water may be used in forming the solution containing a polyelectrolyte and a reducing agent and that water may be used as a liquid dispersing medium for the carbon black dispersion; hence suggesting the claimed requirement for an aqueous solution and an aqueous dispersion. Pendleton describes hydroxylamine sulfate as a preferred acidic reducing agent, cationic polyamine homopolymer resins as a preferred polyelectrolyte and hydrochloric acid as a pH adjustor for use in the treating solution. See column 9, lines 16-56 of Pendleton. Moreover, we note that Pendleton (column 19, l6 line 68 through column 20, line 26) teaches that less defects are obtained by using their method.

As such, appellants principal argument with respect to the subject matter found in claims 13 and 21 is that ". . . Pendleton does not suggest the use of a hydroxyl ammonium compound as a reducing agent generally . . ." (brief, page 6).

However, as explained above, Pendleton does teach that hydroxylamine sulfate may be employed as a reducing agent. Hydroxylamine sulfate[1] can be defined as a hydroxyl ammonium sulfate, which is a hydroxyl ammonium compound. Consequently, we agree with the examiner's obviousness conclusion with respect to claims 13 and 21.

Regarding dependent claims 20 and 23, we note that Florio discloses that carbon black and graphite may each be used alone or together as carbonaceous particles as a coating material prior to electroplating. See column 5, line 40 through column 6, line 21 and column 9, lines 39-41 of Florio. Consequently, we agree with the examiner's determination that it would have been obvious for one of ordinary skill in the art to employ graphite in addition to or in place of carbon black as the carbonaceous material used in the coating dispersion of Pendleton with the reasonable expectation of obtaining similar results. See answer,

[1] See the definition of hydroxylamine sulfate at page 460 of Hawley, The Condensed Chemical Dictionary, 8th Ed. (1975). A copy is attached to this decision.

paragraph bridging pages 6 and 7. Appellants' contentions to the contrary (brief, page 8) are not persuasive since both Pendleton and Florio employ the carbonaceous material as a coating prior to electroplating and after preparing the substrate surfaces for the carbonaceous coating.

Accordingly, we shall sustain the examiner's § 103 rejection of claims 13, 20, 21 and 23.

Our disposition of the examiner's § 103 rejection of dependent claims 14-16 is another matter. Claims 14 and 15 require particular pH conditions for the acid aqueous solution and claims 16 and 22 require hydroxyl ammonium nitrate as a reducing agent. The examiner's predicate for the § 103 rejection of claims 14 and 15 is that "it appears that pH is a result effective variable" (answer, page 6). Such a supposition does not take the place of evidence. While we recognize, as discussed above, that Pendleton may use an acid to adjust pH, the examiner has not established where Pendleton together with the other applied references would have suggested the particularly claimed pH values for the treating solution of Pendleton. With regard to claims 16 and 22, we note that the examiner relies on Growald to suggest the use of a hydroxyl ammonium nitrate salt as the reducing agent in Pendleton, specifically referring to column 3,

lines 30 and 31 thereof at page 5 of the answer. However, the examiner has not fairly explained how the teachings of Growald with respect to a nitrate anion for a compound used to form electroconductive polymer for an electrically conductive plastic sheet would have suggested a hydroxyl ammonium nitrate salt as a reducing agent in Pendleton.

Consequently, we shall reverse the examiner's § 103 rejection of claims 14-16 and 22.

§ 103 Rejection Over Pendleton, Hou and Toro

Regarding dependent claim 18, the examiner relies on Toro in addition to Pendleton to suggest the use of sulfonic acid as the pH adjustor to be used in Pendleton. According to the examiner (answer, page 8), one of ordinary skill in the art would have been led to select sulfonic acid as an alternative to the hydrochloric acid mentioned by Pendleton for adjusting pH of the solution. This is so since Toro teaches that both of those acids are alternatives and each are useful in combination with reducing agents in treating substrates prior to treating with a carbonaceous dispersion. Appellants' arguments (brief, page 9) are directed to Toro, as if applied alone by the examiner, whereas the examiner relies on the combined teachings of Pendleton and Toro. It follows that such arguments by counsel

are not persuasive. Accordingly, we shall sustain the examiner's § 103 rejection of claim 18.

However, with respect to dependent claims 17 and 19, we side with appellants. With respect to claim 17, the examiner additionally relies on Hou to suggest the use of a polyquaternary amine in Pendleton. Here, the examiner (answer, page 8) predicates the rejection on the assumption that Pendleton would not appear to require a particular polyelectrolyte polymer and that Hou teaches a quaternary ammonium group. However, Hou is concerned with forming a filter sheet from cellulose fibers and uses the polyelectrolytes suggested therein as a charge modifier for such a sheet. The examiner has not reasonably explained why one of ordinary skill in the art would have been led to modify the polyelectrolyte used in pretreating a surface prior to carbonaceous material deposition and electroplating as discussed in Pendleton based on the teachings of Hou with respect to a charge modifier for a filter sheet.

With respect to dependent claim 19, the examiner (answer, page 9) argues that adding a surfactant to the treating solution of Pendleton would have been obvious without the citation of any evidence to substantiate that position. Of course, it is the

examiner who has the burden to produce such evidence in presenting a sustainable rejection.

Thus, we shall reverse the examiner's § 103 rejection of claims 17 and 19.

CONCLUSION

The decision of the examiner to reject claims 13, 20, 21 and 23 under 35 U.S.C. § 103 as being unpatentable over Pendleton in view of Doty, Growald and Florio and to reject claim 18 under 35 U.S.C. § 103 as being unpatentable over Pendleton in view of Hou and Toro is affirmed.

The decision of the examiner to reject claims 14-16 and 22 under 35 U.S.C. § 103 as being unpatentable over Pendleton in view of Doty, Growald and Florio and to reject claims 17 and 19 under 35 U.S.C. § 103 as being unpatentable over Pendleton in view of Hou and Toro is reversed.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 CFR § 1.136(a).

AFFIRMED-IN-PART

TERRY J. OWENS Administrative Patent Judge	)	
PETER F. KRATZ Administrative Patent Judge	)	BOARD OF PATENT APPEALS AND INTERFERENCES
ROMULO H. DELMENDO Administrative Patent Judge	)	

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